

Miniature Robotic Vehicles

Smart Robots Create Value by Increasing Personal Safety



Technology and Innovation

Omnitech Robotics International LLC (Omnitech) has completed Phase I, II, and III DARPA SBIR projects. The company's DARPA SBIR Phase I and II focused on development of a miniature robotic vehicle, which led to the development of TOUGHBOT, a robot being used in Iraq to aid in surveillance, building entry, and clearing operations. Omnitech's Phase III work focused on the development of a larger Mule class of vehicle, referred to as the Experimental Robotic Support Vehicle (XRSV). This effort, in turn, led to the development of a next-generation appliqué robotics kit referred to as NGCM1, that is currently entering into service to counter improvised explosive devices (IEDs) in Iraq. The appliqué robotics kit can convert a variety of vehicles to unmanned operation reducing life cycle cost. All of Omnitech's products create value by providing increased safety for personnel performing hazardous operations.

The original, two-pound miniature robotic vehicle combined the capabilities of a PDA, cell phone, video and still camera with a remote control car. However, the single prototype was mechanically fragile and it offered capabilities that were not needed for the bare-bones, utilitarian missions that military end users actually wanted. Building on this lesson, Omnitech developed a product called TOUGHBOT, a throwable, survivable audio/video reconnaissance tool, to meet the

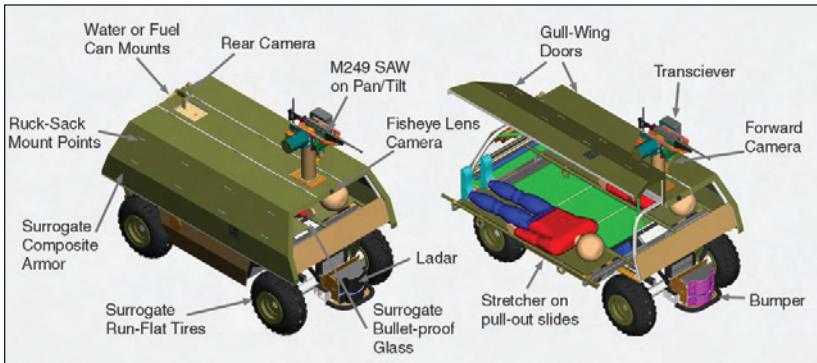


utilitarian mission requirements of ruggedness and reliability. Omnitech's customers ordered 75 units right away.

Reliability is a top priority for Omnitech's customers. TOUGHBOT survives 300 g shock repeatedly. It can be thrown or dropped from a three-story building and will continue to work. The company's NGCM1 appliqué robotic kit is flexible and inexpensive, allowing cost-effective use—even for highly dangerous missions such as IED inspection and neutralization.

According to David Parish, Omnitech's President and CEO, designing its innovative products required a mission-critical way of thinking about the problem. Says Parish, "We stopped thinking like technologists, and thought about what it had to do—no matter what. If your life is on the line, and it has to work,

Omnitech's XRSV allows soldiers control of rescue vehicles from afar



Features of the XRSV

what would you build? Necessity is the mother of invention. More computers, sensors, software, and technical stuff may seem neat, but unless it works 100 percent of the time, forget it. Reliability is key. If it doesn't contribute to the customer or user mission reliability, it is off target."

Omnitech's primary customers and end users include:

- U.S. Army
- U.S. Marine Corps
- Urban search and rescue personnel
- Security personnel

Joint Collaborations

The company's most important collaboration is with BAE Systems, to which it sold a minority ownership position. BAE Systems has provided significant opportunities to support its larger Future Combat Systems (FCS) programs. BAE has also benefitted from the knowledge Omnitech gained through its DARPA SBIR-funded research. FCS has been a major focus since the company was founded—this SBIR has helped address the maturation of technologies for this major program.

Lessons Learned

Omnitech believes that a customer focus for ongoing product sales is the most important issue in the long run. "User" customers are different than the research and development (R&D) support customers. The best situation

is when R&D sponsor agencies such as DARPA and user customers such as the U.S. Army collaborate. This helps technology companies like Omnitech transition R&D to user customers quickly and effectively.

Omnitech offers the following advice to other companies that are participating in SBIRs—or considering it:

- Build a competitive edge at product sales and you will succeed. Product sales is the eventual goal, and R&D is just a means to get there.
- View funding sponsors as customers who have a problem to solve, not just a need for more R&D.
- Use SBIR R&D funds to develop the product, then focus on selling it. Return to R&D only when the product needs improvement.

Economic Impact

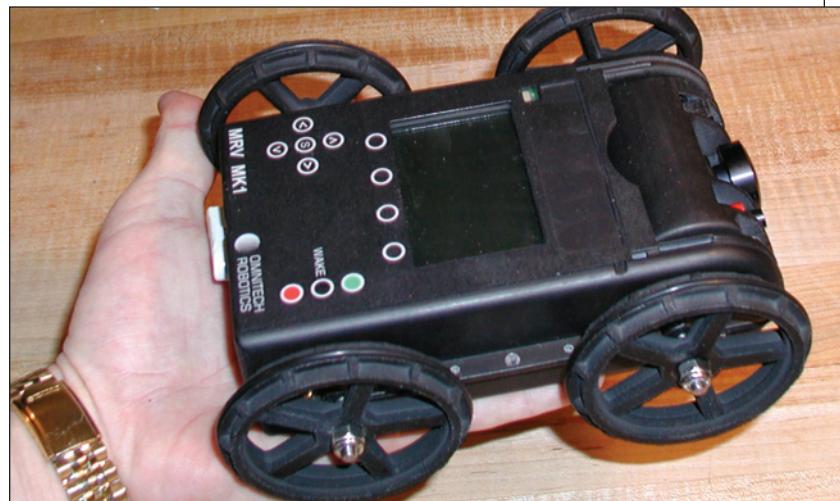
The DARPA SBIR has had a positive financial impact on Omnitech, specifically by leading to new technology that allowed innovative products to be designed and produced, and profits generated. The DARPA funding was also instrumental in helping the company obtain funding from other sources.

SBIR programs have helped the company develop all of its core or baseline technology. DARPA has directly supported about 25 percent of this. Also, the DARPA SBIR has had a positive impact on company growth.

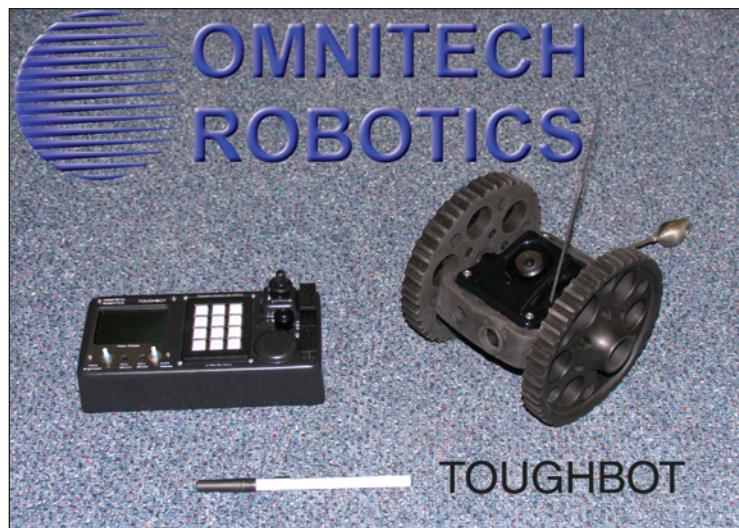
About the Company

Omnitech Robotics International LLC is headquartered in Englewood, Colorado where it employs 11 people and generates \$1.6 million in annual revenues. The company also plans to open a new R&D facility in Maryland that will include a robot vehicle test track. Omnitech is in the business of developing and manufacturing robotic components, controls, and systems for unmanned ground vehicles and broad-based automation. The company focuses on the design, manufacture and support of modular embedded control components for converting any ground vehicle to remote control, teleoperated control, or semi-autonomous control. These components are typically added to existing manned vehicles using robotic conversion kits, or appliqué robotic controls.

Although the company is on the leading edge of the military robotics field, ground vehicle-based robotics is still an emerging technology with divergent emphasis—some towards R&D of more capability, and others towards applications and product development, and maturation of well-integrated and reliable solutions. The company has decided to focus on rapid transition of near-term R&D to reliable products that serve utilitarian markets. Military, security, and search and rescue applications are Omnitech's primary applications emphasis. ■



The creation of the miniature robotic vehicle (MRV) led to the development of further robotic applications for the military



The TOUGHBOT aids in surveillance, building entry, and clearing operations

Company Information

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Englewood, CO 80110	Annual revenue: \$1.6 million (2005)
Phone: 303-922-7773	Revenue growth: 60% (2004–2005)
Fax: 303-922-7775	Number of employees: 11
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